JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

A Statistical Study on employee engagement in Learning Management System

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Abstract: To achieve the objectives of the study, this study design was selected. It was decided to use a combine design, in which a sample of a group was taken all at once. Descriptive in nature, the study relied on unplanned spontaneous observation of the traits of the research subject rather than deliberate manipulation of factors or careful control of the environment. The Education Sector intentionally manipulates data by applying various statistical tests, organizing parts differently, and evaluating the outcomes of various experiments.

Key Words: Education, hypothesis, cross-sectional design, etc.

INTRODUCTION

To accomplish the research goals, a survey design was adopted. A sample is taken at a time from a population using a cross-sectional design. The study's descriptive nature implies that the characteristics of the research topic were observed naturally without intentional manipulation of the variables or management of the circumstances. The population for the current study is made up of e-commerce Customer who use web to buy any item anywhere, anytime. There are numerous University, College; School that is part of Education can be essentially divided different group: Public and Private. The public institutions which are fully or partially supported by the Government and the private institutions which are self-funded.

Universities, Colleges to be contact in order to obtain data from the four disciplines studied. For online data collecting and concurrent database prepar ation, a web link was created. Data was gathered through personal interviews, postal questionnaire distribution, and websi te feedback requests. Ten websites were used to gather the data. Personal assistance was provided in the search for reliable data, timely data collecting, and taking note of qualitative observations about the institutional work culture, all of which h elped in the interpretation of the findings. A total of nearly 600 questionnaires were given out to the intended respondents; 473 of those were returned or 78% of the total. Due to their incompleteness, 10 questionnaires could not be used. In the end, 463 questionnaires with all required fields were used for the study.

STATISTICAL ANALYSIS APPROACH

Descriptive analytics, one-way ANOVA, exploratory factor, measure of scale reliability, correlation, non-metric correlation analysis, and hierarchical multivariate regression analysis were among the statistical methods and tools employed for the study. Version 16.0 of SPSS was used for the analysis. The data was reviewed to see if it had been input consistently once it had been entered. Then, using the aforementioned methodologies, data analysis was carried out. The following is a brief summary of the analytical methods and tools utilized for the analysis:

Variance Analysis (ANOVA)

Based on the data acquired from the samples of the respective populations, analysis of variance (ANOVA) is frequently us ed to examine the difference in means between two or more populations. R.A. Fisher was the person who created this met hod. There are certain presumptions behind ANOVA. A normal distribution with equal variances should exist in each pop ulation. Each sample must be chosen at random and stand alone from the others. When there is one metric dependent varia ble (measured using an interval or ratio scale) and one or more nonmetric or categorical independent variables, ANOVA i s used to compare the means (Malhotra & Dash, 2011).When only one independent variable is used to compare the variati ons in the mean values of the dependent variable, one-way ANOVA is used. In a one-way ANOVA, the total variation of the data is divided into two halves to assess the validity of the hypothesis. The varianc e between the samples makes up the first part, while the variance within the samples makes up the second. The variation within each sample can be attributed to experimental mistakes, while the variation between samples can be attributed to tr eatment effects. One-way ANOVA was employed in the current study to examine the variations in the level of the dependent variable, namely work engagement, of the samples selected based on each of the personal variables regarded as independent variables.

Type of Customer, area, Job, designation, Working hour, gender, educational background, and income were the independent variables for testing each of the hypotheses H01 to H011 mentioned at the outset. A post-hoc test utilizing the Least Square Difference (LSD) approach was used wherever the difference in mean replies was shown to be significant.

Exploratory Factor Analysis

To turn a high number of variables into a manageable number of variables, the current study used exploratory factor analysis (EFA). A data reduction technique called factor analysis looks at the connections between collections of numerous connected variables and distils them down to a small number of fundamental elements. Exploratory factor analysis (EFA) is another name for this technique because it is exploratory in character (Malhotra and Dash, 2011). The following is a description of the major factor analysis statistics that were employed in the study:

Bartlett's test of sphericity was performed to determine whether the data were suitable for factor analysis. The null hypoth esis that all variables are uncorrelated in the population is investigated by Bartlett's test of sphericity. It is founded on the chi-square transformation of the correlation matrix's determinant.

A high test value favours the rejection of the null hypothesis (Malhotra and Dash, 2011). As a result, the factor model's sui tability is determined by the null hypothesis' rejection.

KaiserMeryer(KMO) test for adequate sampling Additionally, the suitability of factor analysis was examined using this test. To conduct factor analysis, a value of 0.5 is preferred. High values between 0.5 and 1.0 show the suitability of fact or analysis, but values less than 0.5 denote the inappropriateness of factor analysis (Malhotra and Dash, 2011).

Principal component analysis: This method of factor analysis was employed in the study. The overall variance in the data is taken into account in principle component analysis. When minimizing the number of elements to be used in analysis in the future, the principal component analysis method is advised (Malhotra and Dash, 2011).

Eigen values: In the study, the number of factors to be preserved was decided using the Eigen value approach. Other components were not included in the model, and only factors with Eigen values greater than 1.0 were kept (Malhotra and Dash, 2011).

Rotation utilizing the varimax approach was used in the study to rotate the factor matrix. The Varimax approach reduces the number of variables with large loadings on a factor through an orthogonal rotation (Malhotra and Dash, 2011).

<u>Reliability at Scale</u>

The degree to which a measurement technique can be relied upon to produce consistent results after repeated application is referred to as scale dependability. The uniformity of several measurements of a variable is what is meant by reliability. For the purpose of evaluating the reliability of the several scales in this study, Cronbach's alpha was computed. The reliability coefficient known as Cronbach's alpha is what defines how reliable the entire scale is. The coefficient alpha will be equal to zero if there is no real score and simply item mistake. The coefficient alpha is equal to 1 if every item is 100 percent accurate and measures the same thing. Cronbach's alpha's permissible limit is typically.70, although in cases of exploratory study, the limit may be lowered to.60 (Hair et al., 2009).

Association-related metrics

Statistics called measures of association are used to assess how strongly two variables are related. The degree of relationship between two variables is measured by correlation. The linear correlation between two variables is quantified by Karl Pearson's coefficient of correlation. The Pearson product-moment correlation coefficient is another name for it. The covariance of two variables divided by the sum of their standard deviations is known as Pearson's correlation coefficient. The letter r is frequently used to symbolize it. The following is the formula for r if there are two datasets, one with n values (x1,...,xn) and the other with n values (y1,...,yn):

$$r = r_{xy} = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2}\sqrt{\sum_{i=1}^{n}(y_i - \bar{y})^2}}$$

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Karl Pearson's correlation coefficient ranges from +1 to -1, with 1 denoting total positive correlation, 0 denoting no correlation, and -1 denoting whole negative correlation. It was used in the current study to determine whether work engagement, as a dependent variable, is related to each of the ten factors identified through factor analysis, namely perceived organizational support, personal and professional orientation, supervisory coaching, climate of participation and recognition, organizational orientation for results, interaction with students, intrinsic rewards, empowerment, task variety, and support from associates, as independent variables.

The same method was applied to determine whether the dependent variable of work engagement is related to the three ind ependent variables of job crafting, the three independent variables of work-life balance, the four independent variables of work stress, and finally the one independent variable of organizational com mitment.

Analysis of Non-Metric Correlation

The link between two ranked variables, or between one ranked variable and one measured variable, is tested using Spearman's rank correlation. It is used to check for correlation between the two variables. The observations are thought to be independent. The ranking of measures for improving work engagement by subgroups of respondents categorized according to gender, kind of institution, designation, remuneration, faculty job area, and district of posting was examined in the present study using Spearman's rho.

Multiple Regression Analysis with Hierarchy

A technique for multiple regression analysis where the researcher, rather than a computer program, chooses the order in which variables are added to and subtracted from the regression equation. It is employed when the researcher feels that particular variables, as well as their placement within the model, should be considered.

Adjusted R2: To account for declining returns, the R2 coefficient of multiple determinations is adjusted for the sample si ze and the number of independent variables. The extra variables don't really contribute much after the first few.

Coefficient of Multiple Determinations: The square of the multiple correlation coefficient R2, also known as the coeffic ient of multiple determination, is used to calculate the strength of connection in multiple regression.

The null hypothesis that the population's $R2_{pop}$ (coefficient of multiple determination) is zero is put to the test using the F test. If k=0, then this is identical to testing the null hypothesis H0. The test statistic has a F distribution with degrees of f reedom of k and (n-k-1).

Partial F Test: An incremental F statistic can be used to determine the significance of a partial regression coefficient, I of Xi. The increment in the explained sum of squares caused by adding the independent variable Xi to the partial regression equation after all the other independent variables have been taken into account forms the basis for the incremental F statistic. When the other independent variables, X2 to Xk, are held constant, the partial regression coefficient, or b1, indicates the change in projected value for each unit change in X1.

To determine whether the ten factors identified through factor analysis—perceived organizational support, personal and professional orientation, supervisory coaching, climate of participation and recognition, organizational orientation for results, interaction with students, intrinsic rewards, empowerment, task variety, and support from associates—are predictive of work engagement, as a dependent variable, hierarchical multiple regressions was used. There was a two-step hierarchical multiple regression analysis. All personal characteristics, including age, gender, educational background, regional background, faculty work area, posting, designation, total experience, experience in present company, and remuneration, were submitted in stage one to be treated as controls. method was applied four times to see whether the dependent variable of work engagement is predicted by the job crafting dimensions, the work-life balancing dimensions, or both.

Dimensions of workplace stress and organizational commitment.

A two-step hierarchical multiple regression analysis was performed each time. To use them as control variables, all personal variables were entered in stage one. Each research goal's statistical analyses are condensed here

Objective	Hypotheses	Statistical Technique
To assess the level of work engagement among the staff (faculty members) working in the study's participating organisations.	N.A	1. Scale Reliability Test, descriptive statistics, and Cronbach's alpha

To investigate the relationship, if any, between personal factors and the degree of work involvement.	H0(1): Work engagement is consistent regardless of the institution type. H0(2): There are no differences in work engagement among faculty work areas. H0(3): Work engagement is unaffected by posting. H0(4): There are no district-specific differences in work engagement. H0(5): The level of work involvement is not affected by designation. H0(6): Work engagement is unaffected by experience level. H0(7): In the existing organisation, work engagement is unaffected by experience. H0(8): There are no age-related differences in work engagement. H0(9): Gender has no bearing on job satisfaction. H0(10): Education level has no bearing on work involvement. H0(11): Salary has no effect on work engagement.	1. ANOVA one-way 2. Least Square Difference Post-Hoc Tests (LSD)
To determine the elements influencing the degree of	N.A	1. Exploratory Factor Analysis
Objective	**Hypotheses**	**Statistical Technique**
Employee commitment to their jobs (faculty members).		2. Scale Reliability Test – Cronbach's alpha coefficient 3. Correlation Analysis – Karl Pearson's coefficient of correlation

		4. Hierarchical Multiple Regression Analysis
To determine the steps that must be taken to improve employees' work engagement (faculty members).	N.A	1. Non-metric Correlation Analysis : Spearman‘s rank correlation coefficient
To investigate the relationship, if any, between job crafting initiatives and faculty members' level of work engagement • Work-life balance, work-related stress, and organizational dedication are all factors.	H0(12): Job crafting and work engagement have no discernible link. H0(13): Work engagement and work-life balance are not significantly correlated. H0(14): Workplace stress and engagement are not significantly correlated. H0(15): Organizational commitment and employment don't significantly influence one another.	1. Investigative Factor Analysis 2.Cronbach's alpha coefficient, a scale reliability test 3.Karl Pearson's coefficient of correlation in correlation analysis 4.Multiple Regression with Hierarchy Analysis

FUTURE PROSPECTS FOR RESEARCH

Future research directions were also discovered by this investigation. The bulk of studies on workplace engagement, particularly those conducted in India, have utilized a cross-sectional design, which makes it impossible to understand why even highly involved workers may occasionally display lower levels of engagement. In order to evaluate the pattern of daily variations in work engagement and pinpoint the causes, longitudinal studies are Such research may have a significant impact on our knowledge of employee wellbeing. The current study looked into the connection between job crafting and work engagement and discovered a favourable correlation. The question of whether all employees have the same propensity for job crafting may be resolved by further research in this area. Can someone be trained to craft jobs? Does personality have anything to do with job crafting? The need for work-life balance policies in HEIs is highlighted by the current study. Studies that map the perspectives of decision-makers in the public and commercial sectors can be useful in determining if such efforts are feasible to implement. They have the power to significantly alter the working environment and boost the workforce participation of numerous societal groups, both of which can significantly improve the level of overall job engagement. When employee well-being is high, work engagement will be sustainable (Robertson and Cooper, 2010). It is possible to expand research on workplace involvement to create a workplace happiness index that aggregates all crucial indicators of employee wellbeing.

CONCLUSION

The research approach used to attain the current study's goals is covered in the publication. The chapter covers a discussio n of the research design and sampling, data collecting, sample description, research tools used for measuring the study's va riables, and lastly an explanation of the statistical analysis method.For a crosssectional descriptive study, a fixed number o f faculty members from each of the four major areas of faculty workCommerce and Business Management (CBM), Scienc e, Engineering and Technology (SET), Applied Medical Sciences (AMS), and Education and Humanities (EHUM)were se lected from public and private higher education institutions using the quota sampling techniqueThe answers came from co lleges and universities in the NCR region. 463 respondents from 41 departments and higher education institutions made up the sample. In terms of gender, institution type, posting, designation, faculty job area, posting, total experience, current organization experience, educational background, regional background, and remuneration, the sample was fairly distributed. There were eight parts of the questionnaire that was used in this investigation.

Aitem scale that examined the respondents' perceptions of themselves, their present jobs, and their current organisations w as constructed for Part I, which dealt with the elements affecting work engagement.
On a sevenpoint Likert scale, with 0 denoting "strongly disagree" and 6 denoting "strongly agree," responses were request ed for a mix of statements that were positively and negatively written.
The scale underwent factor analysis, which revealed 10 distinct factors or dimensions with Cronbach's alpha values over t he permitted threshold of 0.70. (Hair et al., 2009).

It was discovered that faculty members' work engagement varies greatly depending on their discipline or work area, distri ct of posting, designation, total experience, age, educational background, and remuneration.
Regarding respondents' gender, institution type (government or private), and posting at university campus or affiliated coll ege, no statistically significant variance was discovered.

Using oneway ANOVA to examine the association between faculty work area and work engagement, it was shown that fa culty members in the fields of education and humanities were substantially more involved at work than those in applied m edical sciences and business and business management.
The Job Demands and Resources Model of Work Engagement, put forth by Bakker and Demerouti, was used to explain th e findings (2008).

The job engagement of Lecturers was found to be much lower than that of Associate Professors, Professors, and Heads of Departments among the designationbased groups. Compared to associate professors and department heads, assistant prof essors were found to be less engaged.

The findings concurred with those of Winter et al. and Barkhuizen and Rothmann (2006).When work engagement was co mpared to total experience, it was discovered that faculty members with more than 20 years of experience were more prod uctive than those with less than 5 years or between 5 and 10 years of experience.

The result was consistent with a Bakker et al. (2004) study of teachers and other human service workers, which found that specific job resources are connected with an increase in total experience.
Similar to the previous comparison, it was discovered that faculty members with current organisation experience of more t han 20 years were more work engaged than those with less than 5 years, more than 5 to 10 years, and more than 10 to 15 y ears.
The more tenured faculty members' greater levels of job engagement can be linked to the gradual growth of a strong sense of identity and ownership over time, which is likely to increase work engagement.
Designing ways to promote teacher retention in the current organisations has significant consequences for HR policy mak ers.
When work engagement was evaluated among faculty members of different ages, those 55 years and older showed higher levels of involvement than those in the age categories of 25 to 34 and 35 to 34.
This was in line with the outcomes based on title and cumulative experience, which are likewise meant to go better with age.

Faculty members with Ph.D.s were more engaged than those with other postgraduate degrees, according to educational ba ckground. The findings were explained in light of Kahn's (1990) model of personal involvement, which viewed a Ph.D. as a crucial intellectual resource that is likely to increase a faculty member's psychological availability to fully commit to the ir work.The job engagement of faculty members earning less than Rs. 30,000 per month was found to be lower than that of those earning Rs. 30,001 to 50,000 per month and Rs. 1,10,000 and above, according to salary bracket. The justification can be found in the claim made by Hulko-Nyman et al. (2012) those employees' perceptions of benefits and tangible rewards explain devotion, a critical component of work engagement. Salary is a significant employment resource promoting work engagement, according to Demerit et al. (2001).

Finally, it was discovered that faculty members' work involvement did not differ according on their gender, kind of institution (private, government, or government-aided), or location on the university campus.

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